

PATENT + SURRENDERED AS ARTIFACT  
ARTIFACT SHEET ON IPW

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc..  
Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

09342707ZA

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

- ☐ CD(s) containing computer program listing  
Doc Code: Computer Artifact Type Code: P
- ☐ Stapled Set(s) of Extra Color Drawings/Photographs  
Doc Code: Artifact Artifact Type Code: C
- ☐ CD(s) containing pages of specification ☐  
and/or sequence listing ☐  
Doc Code: Artifact Artifact Type Code: S
- ☐ CD(s) with content unspecified  
Doc Code: Artifact Artifact Type Code: U
- ☐ Microfilm(s)  
Doc Code: Artifact Artifact Type Code: F
- ☐ Video tape(s)  
Doc Code: Artifact Artifact Type Code: V
- ☐ Model(s)  
Doc Code: Artifact Artifact Type Code: M
- ☐ Bound Document(s)  
Doc Code: Artifact Artifact Type Code: B
- ☒ Other, description: 5367588  
Doc Code: Artifact Artifact Type Code: Z

Sufficient  
BWH  
3/4/04

The  
United  
States  
of  
America



The Commissioner of Patents  
and Trademarks

*Has received an application for a patent  
for a new and useful invention. The title  
and description of the invention are en-  
closed. The requirements of law have  
been complied with, and it has been de-  
termined that a patent on the invention  
shall be granted under the law.*

*Therefore, this*

United States Patent

*Grants to the person or persons having  
title to this patent the right to exclude  
others from making, using or selling the  
invention throughout the United States  
of America for the term of seventeen  
years from the date of this patent, sub-  
ject to the payment of maintenance fees  
as provided by law.*

*Bence Lehman*

Commissioner of Patents and Trademarks

*Mayoue V. Turner*

Attest



US005367588A

**United States Patent** [19]

Hill et al.

[11] **Patent Number:** 5,367,588[45] **Date of Patent:** Nov. 22, 1994

[54] **METHOD OF FABRICATING BRAGG GRATINGS USING A SILICA GLASS PHASE GRATING MASK AND MASK USED BY SAME**

[75] **Inventors:** Kenneth O. Hill, Kanata; Bernard Y. Malo, Gatineau; François C. Bilodeau; Derwyn C. Johnson, both of Nepean, all of Canada

[73] **Assignee:** Her Majesty in Right of Canada as represented by the Minister of Communications, Ottawa, Canada

[21] **Appl. No.:** 969,774

[22] **Filed:** Oct. 29, 1992

[51] **Int. Cl.<sup>5</sup>** ..... G02B 6/34; G02B 6/12; H01L 31/18

[52] **U.S. Cl.** ..... 385/37; 385/14; 385/129; 385/130; 385/147; 359/566; 359/569; 359/573; 359/900; 437/4; 437/51

[58] **Field of Search** ..... 385/14; 37, 129, 130, 385/131, 147; 359/558, 559, 562, 566, 569, 571, 573, 576, 900; 437/51; 430/4

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

4,241,109 12/1980 Johnson ..... 385/123  
4,806,442 2/1989 Shirasaki et al. .... 430/4

4,807,950 2/1989 Glenn et al. .... 359/566 X  
4,947,413 8/1990 Jewell et al. .... 359/559 X  
5,042,897 8/1991 Meltz et al. .... 385/37  
5,042,898 8/1991 Morey et al. .... 385/37 X  
5,058,977 10/1991 Sorin ..... 385/37 X  
5,066,133 11/1991 Brienza ..... 385/37 X  
5,101,297 3/1992 Yoshida et al. .... 359/566  
5,104,209 4/1992 Hill et al. .... 385/27  
5,175,647 12/1992 Gupta et al. .... 359/566  
5,218,651 6/1993 Faco et al. .... 385/37 X  
5,271,024 12/1993 Huber ..... 385/37 X

**FOREIGN PATENT DOCUMENTS**

0175460 3/1986 European Pat. Off. .... 385/37 X  
0220652 5/1987 European Pat. Off. .... 385/37 X  
0271002 6/1988 European Pat. Off. .... 385/37 X

*Primary Examiner*—Brian Healy  
*Attorney, Agent, or Firm*—Pascal & Associates

[57] **ABSTRACT**

An index grating is imprinted in the core of an optical fiber using a specially designed silica glass phase grating mask. The phase mask is held in close proximity to the optical fiber. Laser irradiation of the phase mask with ultraviolet light at normal incidence imprints (photoinduces) into the optical fiber core the interference pattern created by the phase mask.

**29 Claims, 4 Drawing Sheets**